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**Sarosi**

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(54) **SYSTEM AND METHOD FOR REMOTELY ACCESSING CABLECARD MODULE**

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(51) **Int. Cl.**

| | |
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| ***H04N 21/658*** | (2011.01) |
| ***H04N 7/16*** | (2011.01) |
| ***H04N 7/173*** | (2011.01) |
| ***H04L 29/08*** | (2006.01) |
| ***H04N 21/418*** | (2011.01) |
| ***H04N 21/442*** | (2011.01) |
| ***H04N 21/643*** | (2011.01) |
| ***H04N 21/258*** | (2011.01) |
| *H04L 12/24* | (2006.01) |
| *H04L 29/06* | (2006.01) |

(52) **U.S. Cl.**

CPC ..... ***H04L 67/125*** (2013.01); ***H04N 7/162*** (2013.01); ***H04N 7/17318*** (2013.01); ***H04N 21/25833*** (2013.01); ***H04N 21/4181*** (2013.01); ***H04N 21/4424*** (2013.01); ***H04N 21/64322*** (2013.01); ***H04N 21/6582*** (2013.01); *H04L 41/0213* (2013.01); *H04L 63/102* (2013.01)

(58) **Field of Classification Search**

USPC ..... 709/238

See application file for complete search history.

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(57) **ABSTRACT**

A system for remotely accessing diagnostic information from an access control module includes a host device. The host device is configured to interface with the access control module over a direct connection to retrieve diagnostic information from the access control module in response to a host query from the host device, and to interface with a network server over an Internet protocol (IP) network to provide the diagnostic information relating to the access control module to the network server in response to a server query to an IP network address of the host device. The access control module is non-addressable in the IP network.

**20 Claims, 4 Drawing Sheets**

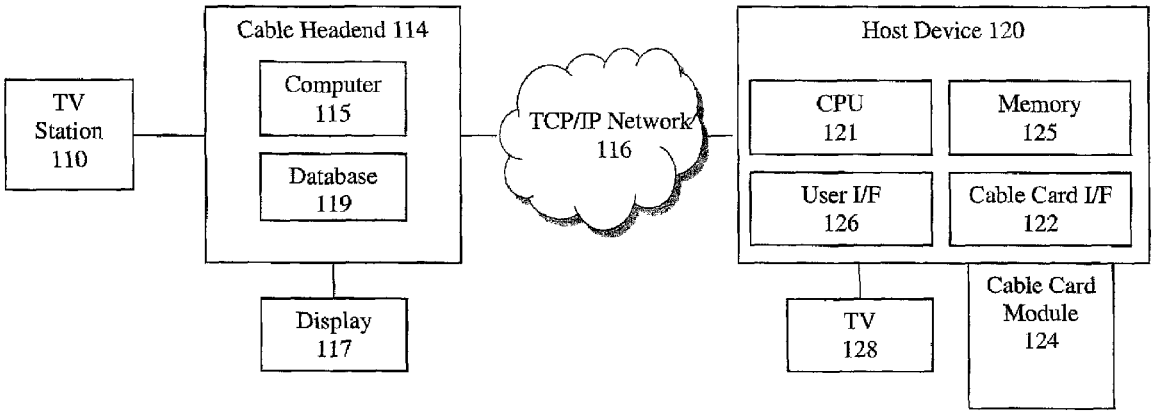

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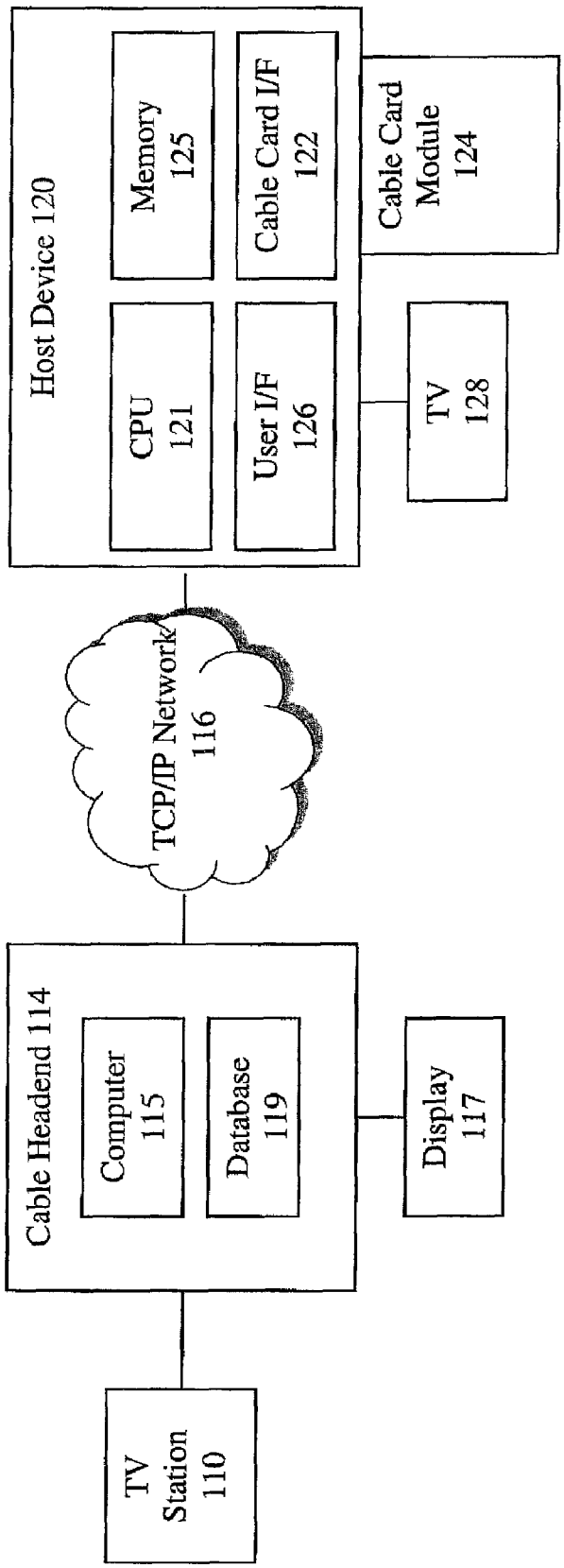
FIG. 1


Host Device 120
Memory 125
Cable Card I/F 122
Cable Card Module 124
CPU 121
User I/F 126
TV 128
TCP/IP Network 116
Cable Headend 114
Computer 115
Database 119
Display 117
TV Station 110

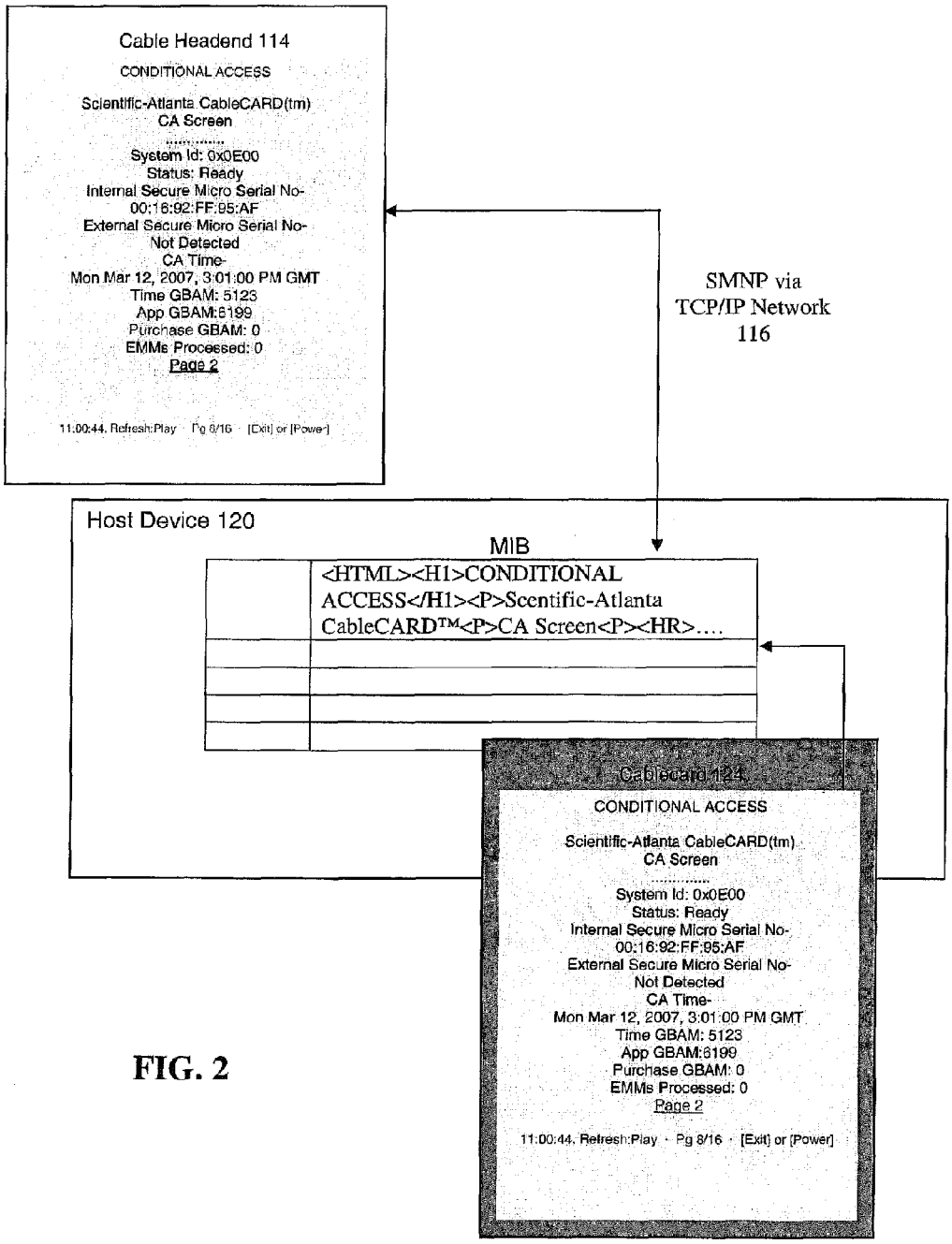

Cable Headend 114
CONDITIONAL ACCESS
Scientific-Atlanta CableCARD(tm)
CA Screen
System Id: 0x0E00
Status: Ready
Internal Secure Micro Serial No-
00:16:92:FF:95:AF
External Secure Micro Serial No-
Not Detected
CA Time-
Mon Mar 12, 2007, 3:01:00 PM GMT
Time GBAM: 5123
App GBAM:6199
Purchase GBAM: 0
EMMs Processed: 0
Page 2
11:00:44, Refresh:Play · Pg 8/16 · [Exit] or [Powe
SMNP via
TCP/IP Network
116
Host Device 120
MIB
<HTML><H1>CONDITIONAL
ACCESS</H1><P>Scentific-Atlanta
CableCARD™<P>CA Screen<P><HR>....
Cablecard 124
CONDITIONAL ACCESS
Scientific-Atlanta CableCARD(tm)
CA Screen
System Id: 0x0E00
Status: Ready
Internal Secure Micro Serial No-
00:16:92:FF:95:AF
External Secure Micro Serial No-
Not Detected
CA Time-
Mon Mar 12, 2007, 3:01:00 PM GMT
Time GBAM: 5123
App GBAM:6199
Purchase GBAM: 0
EMMs Processed: 0
Page 2
11:00:44, Refresh:Play · Pg 8/16 · [Exit] or [Power]

FIG. 2

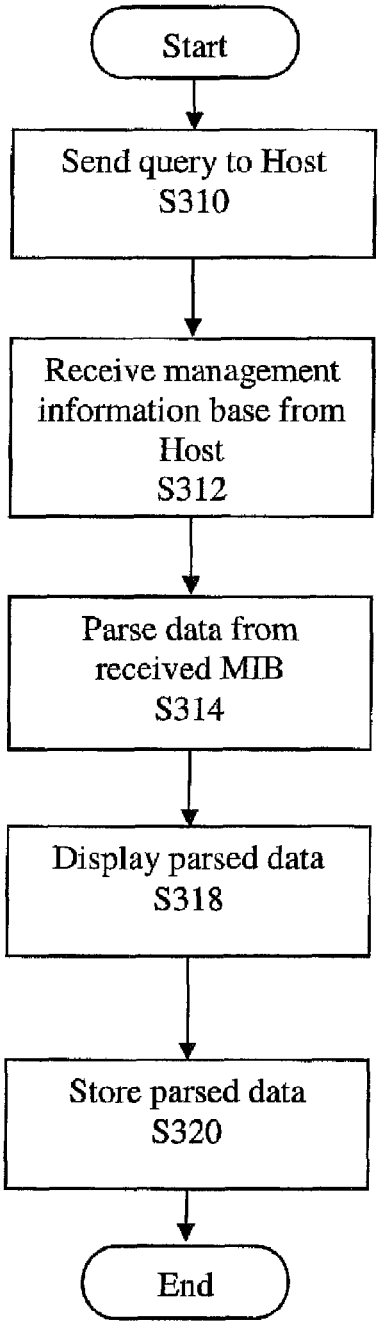

Start
Send query to Host
S310
Receive management information base from Host
S312
Parse data from received MIB
S314
Display parsed data
S318
Store parsed data
S320
End

FIG. 3

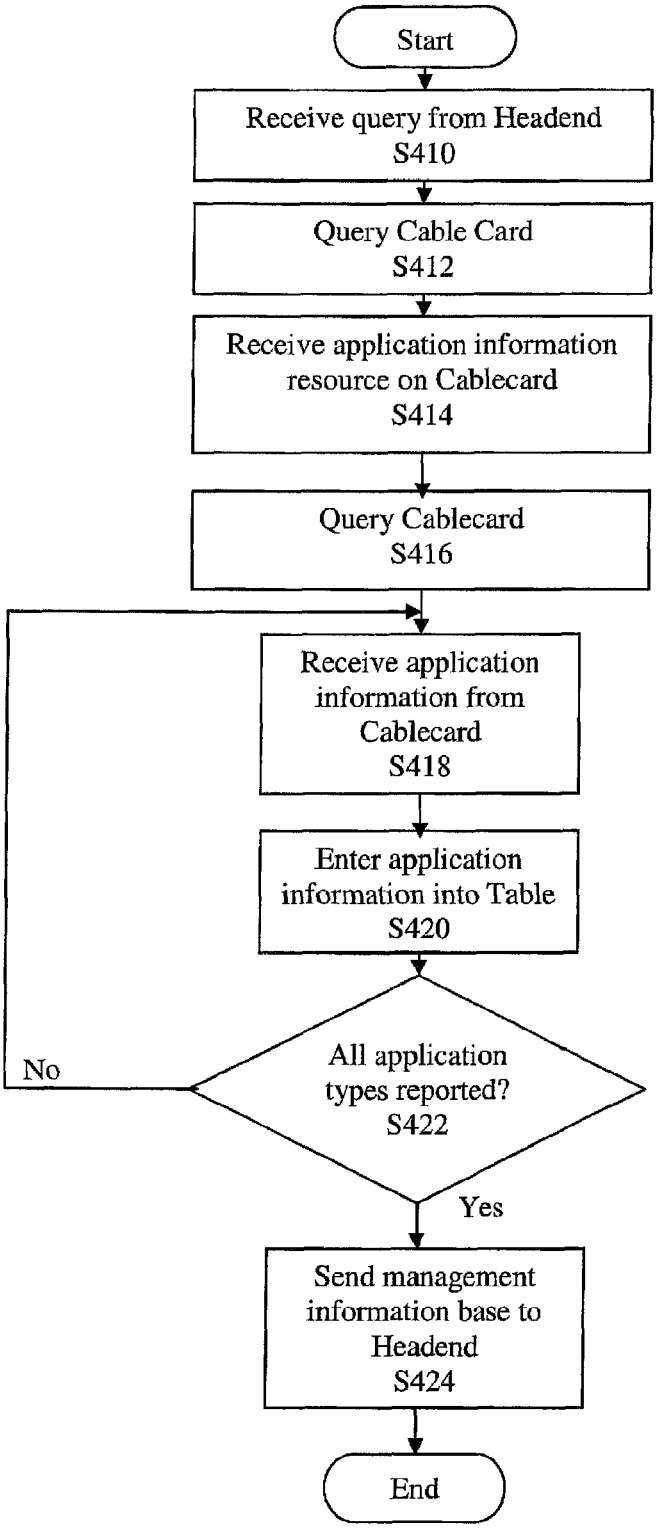

Start
Receive query from Headend
S410
Query Cable Card
S412
Receive application information resource on Cablecard
S414
Query Cablecard
S416
Receive application information from Cablecard
S418
Enter application information into Table
S420
All application types reported?
S422
No
Yes
Send management information base to Headend
S424
End

FIG. 4

# SYSTEM AND METHOD FOR REMOTELY ACCESSING CABLECARD MODULE

## CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation application of application Ser. No. 11/930,532, filed on Oct. 31, 2007, which is hereby incorporated by reference for all purposes.

## BACKGROUND

As demand for digital entertainment increases, multimedia content providers, such as television broadcasters, increasingly face the problem of identifying and addressing faulty systems. Customer equipment, in particular, presents a challenge in that host devices, which receive and demodulate programming signals and provide interface functionality, are located at the customer's premises. The host devices typically interface with access control modules, which limit access to programming content by enabling encryption/decryption of signals, user authentication and the like. The access control modules may be implemented, for example, using a separate cablecard or a built-in module providing essentially the same functionality as a cablecard. Sending technicians to customer locations for diagnosing and repairing problems which may occur in the host devices and/or the access control modules is time consuming, expensive and otherwise inefficient.

Presently, various problems occurring at a host device may be remotely diagnosed, for example, at a cable headend computer, over a Transmission Control Protocol (TCP)/Internet Protocol (IP) network. This is accomplished, in part, using an IP address of the host device to identify and contact the host device in order to retrieve associated data. However, such remote contact is not possible for systems that are not separately addressable on the network.

For example, the United States has adopted the OPENCABLE™ standard by Cable Television Laboratories, Inc. The OPENCABLE™ host middleware includes the OPENCABLE™ Application Platform (OCAP) standard, which supports bi-directional communications between the host at the customer premises and the headend computer. Accordingly, diagnostic information relating to a number of predetermined parameters may be provided through the TCP/IP network using the IP address of the host.

However, the OPENCABLE™ standard includes CABLECARD™ specifications for access control modules, which provide content copy protection and customer authentication. The access control modules are not directly IP addressable. Also, although CABLECARD™ supports providing data from an access control module, such as HyperText Markup Language (HTML) pages, the data may be shown only on the host display (e.g., the customer's television set or monitor). Accordingly, to the extent the HTML formatted data provides diagnostic information, a technician must be physically present at the customer site to view the information in order to detect and address any problems with the access control module.

## SUMMARY

In a representative embodiment, a system for remotely accessing data from a non-addressable access control module over a communications network, includes a host device, which is configured to interface with a network server remotely located from the host device and the access control module. The network server may be included in a cable headend. The host device includes a table populated by information provided by the access control module in response to a query from the host device. The host device provides at least a portion of the table to the server through the communications network in response to a server query to a network address of the host device. The table may be included in a management information base (MIB) of the host device.

The communications network may include an Internet Protocol (IP) network, and the network address of the host device may be an IP address. The access control module may be a non-IP addressable device. Further, the access control module may include a separate card, with which the host device interfaces through a Personal Computer Memory Card International Association (PCMCIA) interface. The separate card may be configured as a CABLECARD™ according to the OPENCABLE™ standard.

The host device may send the query to a Uniform Resource Locator (URL) associated with the information provided by the access control module, the URL being previously provided to the host device in an application information resource. The information provided by the access control module may be HyperText Markup Language (HTML) formatted.

In another representative embodiment, a system for remotely accessing information of a cablecard module configured to control access to programming content includes a cable headend computer. The cable headend computer is configured to receive an MIB from a host device, corresponding to the cablecard module, over an IP network, in response to a first query from the headend computer to the host device. The MIB includes diagnostic information provided by the cablecard module in response to a second query from the host device to the cablecard module.

The host device may be an IP addressable device and the cablecard module may be a non-IP addressable device. The information provided by the cablecard module may be HTML formatted. The cablecard module may be a CABLECARD™ in accordance with the OPENCABLE™ standard. Also, the MIB may be Simple Network Management Protocol (SNMP) formatted.

The headend computer may also parse the diagnostic information provided by the cablecard module for analysis. Also, the system may further include a display which displays at least a portion of the parsed information, and a database which stores at least a portion of the parsed information.

In another representative embodiment, a method for remotely accessing information on a cablecard module, configured to provide access control of programming content, includes querying a host device, associated with the cablecard module, over an IP network, and receiving data from an MIB of the host device over the IP network in response to the query. The MIB data includes information provided by the cablecard module in response to a host query from the host device to the cablecard module. The received cablecard information is parsed for at least one of displaying and storing at least a portion of the cablecard information.

The host device may have an IP address and the cablecard module may have no IP address, and the MIB may be SNMP formatted. The cablecard information may be included in an ocStbHostCCAppInfoEntry of an ocStbHostCCAppInfoTable of the SNMP MIB.

## BRIEF DESCRIPTION OF THE DRAWINGS

The present teachings are best understood from the following detailed description when read with the accompanying

drawing figures. The features are not necessarily drawn to scale. Wherever practical, like reference numerals refer to like features.

FIG. **1** is a block diagram illustrating a system for remotely accessing cablecard information, according to a representative embodiment of the present invention.

FIG. **2** is a diagram illustrating a representative data table, according to a representative embodiment of the present invention.

FIG. **3** is a flowchart illustrating a method for remotely accessing cablecard information, according to a representative embodiment of the present invention.

FIG. **4** is a flowchart illustrating a method for remotely accessing cablecard information, according to a representative embodiment of the present invention.

## DETAILED DESCRIPTION

In the following detailed description, for purposes of explanation and not limitation, representative embodiments disclosing specific details are set forth in order to provide a thorough understanding of the present teachings. Descriptions of well-known devices, hardware, software, firmware, methods and systems may be omitted so as to avoid obscuring the description of the example embodiments. Nonetheless, such hardware, software, firmware, devices, methods and systems that are within the purview of one of ordinary skill in the art may be used in accordance with the representative embodiments.

FIG. **1** is a block diagram illustrating a system for remotely accessing data, including diagnostic information, according to a representative embodiment of the present invention. A cable headend **114**, e.g., including a regional network server, is configured to receive signals having multimedia content from various sources, indicated by a representative television station **110**, over a network **112**. The network **112** may be any communications network capable of communicating the content to the headend **114**, including cable, fiber or satellite networks, for example. In an embodiment, the network **112** is an IP-based network for communicating digital data content.

The headend **114** may be situated to provide signaling downstream to multiple customers within a particular geographic region over a communications network, such as a TCP/IP network **116**. In an embodiment, the network **116** is physically implemented over a hybrid fiber coaxial (HFC) network, although other data communication networks, such as cellular networks, satellite networks, coaxial cable networks and the like, may be implemented without departing from the spirit and scope of the present invention. The headend **114** includes a computer **115**, which parses and processes information received from a host device **120**. The parsed information may be displayed on a headend display **117** and/or stored in a headend database **119**, for example.

Each customer has on-premises equipment for receiving the digital content, indicated in FIG. **1** by the host device **120**, which corresponds to a representative customer. The host device **120** may be a digital multimedia receiver, such as a digital ready television, a set top box, a digital video disk (DVD) player, or the like. The region serviced by the headend **114** includes a number of customers, each of whom has a corresponding host, although the structure and operation of only one host (i.e., the host device **120**) is described for purposes of simplifying the explanation. The host device **120** is addressable on the network **116** and thus has, for example, an associated IP address. Accordingly, the host device **120** is capable of bi-directional communications with the headend **114** over the network **116**. In an embodiment, the host device **120** may be implemented in accordance with OPENCABLE™ Host Device 2.0 Core Functional Requirements, OC-SP-HOST2.0-CFR-I13-070323, and OPENCABLE™ Host Device 2.0 Core Functional Requirements, Engineering Change Request (ECR) 1038, HOST2.0-CFR-R-07.1038-1, the contents of each of which are incorporated herein by reference.

In the depicted embodiment, the host device **120** includes an interface **122** to a cablecard module **124**, e.g., conforming to the CABLECARD™ standard, for providing a conditional access function for the OPENCABLE™ host device **120**. For example, the cablecard module **124** may include decryption functionality for decrypting digital content received from the headend **114** and user authentication functionality to authenticate the customer, when necessary. The cablecard module **124** may be an internal module or a separate card. When the cablecard module **124** is a separate card, the interface **122** may be a standard Personal Computer Memory Card International Association (PCMCIA) interface, as identified in the OPENCABLE™ standard. The cablecard module **124** is not directly addressable remotely on the network **116**. In an embodiment, the cablecard module **124** may be implemented in accordance with CABLECARD™ Interface 2.0 Specification, OC-SP-CCIF2.0-I10-070323, the contents of which is incorporated herein by reference.

The host device **120** is also shown as including a central processing unit (CPU) **121**, a memory **125** and a user interface **126**. With respect to the user interface **126**, the received digital content may be displayed to the customer at a display **128** through the user interface **126**. Also, configuration and performance information from the host **124** and/or the cablecard module **124**, including diagnostic data, may be viewed at the display **128** through the user interface **126**, as needed. Likewise, various commands and instructions, including channel and programming selection, authentication data and the like, may be sent and received by the host device **120**, for example, through the user interface **126**. Such commands and instructions may be processed by the CPU **121**, which may also perform various programming and signal processing functions, such as digital tuning, for example.

In an illustrative embodiment, the host device **120** has a Simple Network Management Protocol (SNMP), and thus may include an SNMP Management Information Base (MIB) object populated by host device information, including diagnostic information, and stored in the memory **125**. The stored MIB includes multiple tables of data values corresponding to various parameters of the host device **120**, as well as parameters retrieved from the cable card module **124**, as discussed below. Accordingly, a remote location, such as the headend **114**, may access the stored MIB to retrieve the MIB data, including the diagnostic information. More particularly, the MIB enables the computer **115** of the headend **114** to obtain a predetermined list of parameters from the host device **120** through the network **116** in response to a query, which may includes, for example, an object identifier (OID) corresponding to MIB data or a group of MIB data. The computer **115** may therefore query for any specific MIB value. This enables obtaining diagnostic information, troubleshooting and debugging the host device **120** from the headend **114**, without having to be physically present at the customer site.

An example of the MIB is defined by the OPENCABLE™ specification, e.g., OPENCABLE™ Host Device 2.0 Core Functional Requirements, OC-SP-HOST2.0-CFR-I13-070323, and OPENCABLE™ Host Device 2.0 Core Functional Requirements, identified above, which provides attributes of the host device **120**, but not of the cablecard module **124**, for example. Therefore, these values are not

conventionally accessible through the MIB of the host device **120**. Further, the cablecard module **124** does not have its own MIB because it not directly IP addressable, as discussed above. The cablecard module **124** does, however, have a man machine interface (MMI), which enables various values to be displayed on the customer display **128**, for example, through HTML formatted pages. Therefore, according to an embodiment of the present invention, the HTML data is placed into an additional table of the MIB on the host device **120**, which can be queried, e.g., by the headend **114**, for remote access to the cablecard module **124** information.

The CABLECARD™ Interface (CCIF) 2.0 Specification, OC-SP-CCIF2.0-I10-070323, discussed above, requires the cablecard module **124** to support an application information resource, which enables the host device **120** to query the cablecard module **124** for information on the current state of the cablecard module **124**. For example, the application information resource may define the following information types:

| | |
|---|---|
| 0x00 | Conditional access; |
| 0x01 | CABLECARD ™ binding information application; |
| 0x02 | IP Service; |
| 0x03 | Network interface [Society of Cable Telecommunications Engineers (SCTE) Standard 55-2]; |
| 0x04 | Network interface [SCTE Standard 55-1]; |
| 0x05 | Copy protection application; |
| 0x06 | Diagnostic; |
| 0x07 | Undesignated; and |
| 0x08 | Network interface [Data Over Cable Service Interface Specifications (DCSIS) Set-top Gateway (DSG)]. |

The information is provided to the host device **120** under the control of the CPU **121** by the cablecard module **124** in the form of HTML pages, which contain labels and values for specific parameters on the cablecard module **124**. Each HTML page is limited to a maximum of 16 lines of 32 characters. Therefore, when the information is longer than 16 lines, the message on the HTML page may include up to 16 lines of text, plus a hyperlink pointing to an additional HTML page. The host device **120** can then display the HTML pages, e.g., at the display **128** via the user interface **126**, which may be used for trouble shooting.

In addition, in accordance with an embodiment of the present invention, the host device **120** populates a table with data from the HTML pages, e.g., which are from the MMI applications of the cablecard module **124**. The table containing the information related to the cablecard module **124** is included in the SNMP MIB, which is remotely accessible by the headend **114**. See, e.g., OPENCABLE™ Host Device 2.0 Core Functional Requirements, Engineering Change Request (ECR) 1038, HOST2.0-CFR-R-07.1038-1. The data from the HTML pages and/or the MIB may be stored, for example, in the memory **125**.

FIG. **2** is a diagram illustrating a representative data table of the cablecard module **124**, according to a representative embodiment of the present invention. The representative cablecard module **124** shows illustrative application information resource data, which is sent to the host device **120** in response to a query and used to populate a table in the MIB of the host device **120**. As discussed above, the cable headend **114** is able to remotely access the HTML data in SNMP from the MIB table of the host device **120** via the TCP/IP network **116**, for example. The cable headend is then able to effectively retrieve the same application information resource data provided by the cablecard module **124** to the headend **114**, even though the cablecard module **124** does not have an IP address on the network **116**.

FIG. **3** is a flowchart illustrating a method of the cable headend **114** receiving cablecard information from a remote location, according to a representative embodiment of the present invention. FIG. **4** is a flowchart illustrating a method of the host device **120** obtaining the information from the cablecard and providing the cablecard information to the remote location, according to a representative embodiment of the present invention.

Beginning at step S**310** of FIG. **3**, the headend **114** (e.g., via the computer **115**) sends a query to the host device **120** through the network **116**, requesting information regarding the host device **120**, including the cablecard module **124**. The query is directed to the IP address of the host device **120**, and may request specific SNMP MIB parameters of the host device **120** to retrieve diagnostic information relating to the cablecard module **124**.

Referring to FIG. **4**, the host device **120** receives the query from the headend **114** at step S**410**. At step S**412**, the host device **120** (e.g., via the CPU **121**) queries the cablecard module **124** to retrieve the application information resource of the cablecard module **124**. The cablecard module **124** may provide the application information to the host device **120** in an application_info_cnf( ) Application Programming Data Unit (APDU), for example. The host device **120** receives and opens the application information resource at step S**414**. Alternatively, the host device **120** may use cablecard information obtained from an earlier application information resource query, although the data would not be as current.

The host device **120** queries the cablecard module **124** at step S**416** for specific data, for example, using the uniform resource locator (URL) relating to the data supplied by the cablecard module **124** in the application_info_cnf( ) APDU. The host device **120** may send a server_query APDU to the cablecard module **124** to request the information. In response to the query, the cablecard module **124** sends the requested information in an HTML format, which the host device **120** receives in step S**418**. The HTML formatted information may be included in a server_reply APDU. The host device **120** places data from the HTML formatted information into a table at step S**420**. For example, the host device **120** may place the HTML data bytes into an ocStbHostCCAppInfoEntry of an ocStbHostCCAppInfoTable in the SNMP MIB of the host device **120**.

At step S**422**, the host device **120** determines whether all of the application types associated with the requested cablecard module information have been reported. For example, the various types of applications will be initially identified to the host device **120** in the application_info_cnf( ) ADPU received at step S**414**. When there are still unreported application types (step S**422**—YES), the process returns to step S**418**, where the host device **120** receives additional information of a different application type from the cablecard module **124**, which information is then entered into the table at step S**420**.

When it is determined that there are no more unreported application types (step S**422**—NO), the host device **120** sends the management information, e.g., in the host device SNMP MIB, to the computer **115** of the headend **114** through the network **116** at step S**424**, which the headend **114** receives at step S**312** of FIG. **3**. An application running on the headend computer **115** parses the HTML data at step S**314** and renders it to the headend display **117** at step S**318**. In an embodiment, the application may also store the parsed HTML data in the database **119** at step S**320**.

Accordingly, the IP addressable host device **120** is used as a proxy for retrieving information, including diagnostic data, from a non-IP addressable cablecard module **124**. Generally, the host device **120** creates an MIB table dedicated to the

parameters of the cablecard module **124**. The MIB table is populated using HTML formatted information retrieved from the cablecard module **124**. The HTML formatted information may be the same information used for HTML pages displayable at the customer display **128**. The MIB table is remotely accessible to the headend **114** over the network **116**.

Although the present teachings have been described in detail with reference to particular embodiments, persons possessing ordinary skill in the art to which the present teachings pertain will appreciate that various modifications and enhancements may be made without departing from the spirit and scope of the claims that follow. Also, the various devices and methods described herein are included by way of example only and not in any limiting sense.

What is claimed:

**1**. A system for remotely accessing diagnostic information from an access control module, the system comprising:

a host device to interface with a network server over an Internet protocol (IP) network,

the host device configured to interface with the access control module over a direct connection to retrieve diagnostic information from the access control module, regarding a current state of the access control module, in response to a host query from the host device, and

to provide the diagnostic information relating to the access control module to the network server in response to a server query to an IP network address of the host device, wherein the access control module is non-addressable in the IP network, and wherein the host device sends the host query to a Uniform Resource Locator (URL) associated with the diagnostic information provided by the access control module, the URL being previously provided to the host device.

**2**. The system of claim **1**, wherein the host device comprises a table populated by the diagnostic information from the access control module, at least a portion of the table being provided to the network server.

**3**. The system of claim **2**, wherein the table is included in a management information base (MIB) of the host device.

**4**. The system of claim **1**, wherein the host device comprises an interface configured to enable the direct connection to the access control module, the interface providing conditional access to the access control module.

**5**. The system of claim **4**, wherein the interface comprises a Personal Computer Memory Card International Association (PCMCIA) interface.

**6**. The system of claim **1**, wherein the diagnostic information is HyperText Markup Language (HTML) formatted.

**7**. A host device comprising:

an access control module interface configured to enable conditional access to an access control module connected to the host device;

a network interface configured to enable communication with a cable headend computer via an Internet protocol (IP) network, the host device being addressable on the IP network and the access control module being non-addressable in the IP network;

a central processing unit (CPU) configured to retrieve from the access control module diagnostic information regarding a current state of the access control module via the access control module interface, and to provide the diagnostic information to the cable headend computer via the network interface and to receive digital content from the cable headend computer via the network interface; and

a user interface configured to display the received digital content via a display and to display the diagnostic information from the access control module via the display,

wherein the user interface is further configured to receive channel selection and authentication data entered by a user.

**8**. A host device comprising:

an access control module interface configured to enable conditional access to an access control module connected to the host device;

a network interface configured to enable communication with a cable headend computer via an Internet protocol (IP) network, the host device being addressable on the IP network and the access control module being non-addressable in the IP network;

a central processing unit (CPU) configured to retrieve from the access control module diagnostic information regarding a current state of the access control module via the access control module interface, and to provide the diagnostic information to the cable headend computer via the network interface and to receive digital content from the cable headend computer via the network interface; and

a memory configured to store the diagnostic information retrieved from the access control module.

**9**. The host device of claim **8**, further comprising:

a user interface configured to display the received digital content via a display.

**10**. The host device of claim **9**, wherein the user interface is further configured to display the diagnostic information from the access control module via the display.

**11**. The host device of claim **8**, wherein the access control module interface comprises a Personal Computer Memory Card International Association (PCMCIA) interface.

**12**. The host device of claim **8**, wherein the diagnostic information is provided to the host device by the access control module in the form of HyperText Markup Language (HTML) pages.

**13**. A host device comprising:

an access control module interface configured to enable conditional access to an access control module connected to the host device;

a network interface configured to enable communication with a cable headend computer via an Internet protocol (IP) network, the host device being addressable on the IP network and the access control module being non-addressable in the IP network;

a central processing unit (CPU) configured to retrieve from the access control module diagnostic information regarding a current state of the access control module via the access control module interface, and to provide the diagnostic information to the cable headend computer via the network interface and to receive digital content from the cable headend computer via the network interface; and

a Simple Network Management Protocol (SNMP) Management Information Base (MIB) object populated by host device information comprising a table containing the diagnostic information.

**14**. A host device comprising:

an access control module interface configured to enable conditional access to an access control module connected to the host device;

a network interface configured to enable communication with a cable headend computer via an Internet protocol (IP) network, the host device being addressable on the IP

network and the access control module being non-addressable in the IP network; and

a central processing unit (CPU) configured to retrieve from the access control module diagnostic information regarding a current state of the access control module via the access control module interface, and to provide the diagnostic information to the cable headend computer via the network interface and to receive digital content from the cable headend computer via the network interface,

wherein the access control module comprises decryption functionality for decrypting the digital content received from the cable headend computer and user authentication functionality to authenticate a user.

**15**. A host device comprising:

an access control module interface configured to enable conditional access to an access control module connected to the host device;

a network interface configured to enable communication with a cable headend computer via an Internet protocol (IP) network, the host device being addressable on the IP network and the access control module being non-addressable in the IP network; and

a central processing unit (CPU) configured to retrieve from the access control module diagnostic information regarding a current state of the access control module via the access control module interface, and to provide the diagnostic information to the cable headend computer via the network interface and to receive digital content from the cable headend computer via the network interface,

wherein the CPU retrieves the diagnostic information from the access control module device in response to a query to a Uniform Resource Locator (URL) previously associated with the diagnostic information.

**16**. The host device of claim **15**, wherein the diagnostic information is HyperText Markup Language (HTML) formatted.

**17**. The host device of claim **15**, further comprising:

a user interface configured to display the received digital content via a display, and to display the diagnostic information from the access control module via the display.

**18**. The host device of claim **15**, wherein the access control module interface comprises a Personal Computer Memory Card International Association (PCMCIA) interface.

**19**. A method for remotely accessing diagnostic information provided by an access control module connected to a host device, the host device having conditional access to the access control module, the method comprising:

querying the host device for the diagnostic information via an Internet Protocol (IP) network; and

retrieving the diagnostic information via the network using the host device as a proxy, wherein the host device is IP-addressable and the access control module is non-IP addressable,

wherein the diagnostic information comprises information on a current state of the access control module, and

wherein retrieving the diagnostic information using the host device as a proxy comprises receiving a management information base (MIB) table created by the host device, and populated using the diagnostic information retrieved from the access control module.

**20**. The method of claim **19**, wherein the diagnostic information is HyperText Markup Language (HTML) formatted.

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